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### **REMARKS/ARGUMENTS**

Reconsideration of this application is respectfully requested in view of the foregoing amendments and discussion presented herein.

### 1. Restriction requirement.

The Examiner has determined that the application contains claims directed to patentably distinct species; that is, the species associated with Claims 1-10 as Species I, Claims 11-23 as Species II, and Claims 24-31 as Species III.

In response, the Applicant confirms its telephone election made on March 14, 2005 during which the species associated with Claim 1 - 10 was elected. The Applicant confirms its election without traverse and cancels Claims 11-31 without any prejudice, waiver, or estoppel, and without forfeiture or dedication to the public, with respect to the original subject matter of the claims as originally filed or in their form immediately preceding these amendments.

### 2. Objection to Claim 9.

Claim 9 was objected to for a lack of antecedent basis for "said means for audibly indicating a sudden rise in circuit voltage" within Claim 1 to which it depends.

The above phrasing of Claim 9 has been amended to agree with that of Claim 1.

3. Claims 1 and 3-9 are rejected under 35 U.S.C. § 103(a).

Claims 1 and 3-9 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Berger (U.S. Patent No. 3,991,413).

After carefully considering the grounds for rejection the Applicant responds as follows.

<u>Claim 1</u>. Independent Claim 1 is drawn to an apparatus for tracing electrical shorts in a circuit under test.

Considering the inventions on the whole, the differences between the relied upon reference of Berger and Applicant's invention are distinct and profound. Berger teaches an apparatus for detecting mechanical failures in a chair lift, whereas the Applicant system is drawn to the tracing of electrical shorts. These are not within the

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same areas of art. It is highly doubtful that a person interested in tracing electrical shorts, such as on a vehicle, would seek out systems for testing chair lift cables.

Berger's apparatus is an integral part of the mechanical chair lift system, it is not portable, nor is it configured for being connected anywhere along the length the wiring circuit (this now being directly recited in the claim). The testing performed by Berger's apparatus requires that the monitoring circuitry and the monitored circuitry be configured/tuned to work with one another (see col. 2, lines 4-10). Applicant's apparatus does not require that the circuitry under test be prepared for testing in any way, and as described in the specification one of the most important features is that it is minimally invasive, giving a minimal tendency to alter the condition of the circuitry that it tests.

There is a single paragraph in the disclosure of Berger's patent that addresses the detector circuit function, see column 4, lines 7-25. This section of Berger teaches that a reduction in the resistance of the circuit comprised of the various detector means and the reference resistor changes the voltage at the output of the current generator (controlled current sink), and that this voltage change is predictable because the resistance of the detector means and the reference resistor are preselected in value to produce a predictable voltage at the output of the constant current generator. Most of the rest of the text appears to deal with the various peripheral features, not having to do with the fault detection itself.

The Examiner states that Berger discloses "audibly indicating a sudden change in a circuit under test" as per column 2, lines 6-10 of Berger. However, Berger provides no such teachings of detecting "sudden changes" as that is understood generally and more specifically in relation to the teachings of the present invention.

Berger detects ANY change of sufficient amplitude which has existed for a sufficient length of time (i.e., the converse of sudden). These aspects are described within Berger (col. 2, lines 4-10) as follows: "The voltage at the output of the constant current generator predictably changes in relation to the change in resistance. The

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detector circuit senses the voltage change and sends a detection signal to activate operation means which may be an alarm, visual/audio indicator, electro-mechanical Indicator or the like." Berger therefore relies on detecting fixed values of change since it is always attached to the same chair lift cables.

Berger does describe time related aspects, but this relates to a time delay that is built into the switching of the fault detector circuit, making it not respond to any change that occurs for less than a given period of time (so that it intentionally won't detect sudden changes), and it is done because of the bouncing that occurs in the lift cable. This bouncing would otherwise produce false detections if not for the switching delay. In other words, Berger's apparatus will not respond to changes in the monitored condition that occur suddenly. Berger teaches this delayed response is in column 6, lines 55-66. Berger therefore more properly teaches away from detection based on sudden changes. By contrast, Applicant's circuit only responds to those conditions which arise in a sufficiently short period of time (although not necessarily instantaneously). Accordingly the temporal responses of Berger in relation to those described by the instant application are in opposition, which further supports the differentiation between the mechanical system monitoring of Berger and the instant application.

The above aspects of Berger illustrate why Berger does not provide the necessary support for detecting sudden changes, and in fact states rather specifically the predictable (not sudden) nature of the sensing by Berger, and the ignoring of changes which do arise suddenly (i.e., cable hopping). The changes detected by Berger are over time and related to a fixed threshold. Consequently, the Berger reference does not teach what it was purported to teach and as a result it does not support the obviousness rejection.

It should be readily recognized that in the short tracing device of the applicant the audible signal is generated only in response to detecting sudden changes, the amended claim reciting ", in relation to a preceding value of conductance and not a

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fixed value of conductance". This ability to trigger the audible signal only on sudden changes, and further only on sudden changes in relation to the preceding value (and not a fixed value) provides numerous benefits as brought out in Applicant's specification.

Additional distinctions exist between Claim 1 and the relied-upon reference, including the following.

The term "tracing" within Claim 1 is a verb connoting action and it is used in the preamble in its commonly understood sense. The preamble thus describes apparatus that are configured for use in a tracing process which indicates that the position of the short is traced along the circuit. The amended claim even now states it to be a "wiring circuit" - adding further distinction. Tracing is described in the specification, such as the following portion of paragraph [0007]: "Shorts which arise in wiring for vehicles, trucks, trailers, tractor-trailer rigs and so forth often result from shorts between one or more wires and the frame of the vehicle, and is often difficult to trace. It should be appreciated, however, that a short with continuous conductance is much easier to diagnose than a short which appears only intermittently, because unless the circuit is in a shorted condition one cannot perform electrical tests to locate the short. Complicating the tracing process is the fact that the vehicle circuit being tested typically comprises a single wire that is usually contained somewhere within a somewhat stiff bundle of similar wires which is often protected by a sleeve or overwrap of some form."

The claim additionally recites in relation to wiring circuit under test that "said means for producing current configured for establishing an electrical connection to the wiring circuit anywhere along the length of the wiring circuit". This connotes further the tracing ability of Applicants device and this distinction and its benefits are brought out clearly in the specification.

Furthermore, aside from a lack of teachings or suggestion within Berger, there is also no need for the above elements within the Berger reference - wherein motivation is lacking for combining circuits with Berger to provide these elements. Since there is no

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suggestion, teaching or motivation which can be found in the reference from which a person having ordinary skill in the art would find it obvious to modify the device of Berger to correspond to that described in the Applicant's claims, Claim 1 recites structure which is patentable over the cited references for purposes of 35 U.S.C. § 103.

Consequently, independent Claim 1 describes a number of elements which do not comport with any teachings within the Berger reference, with additional distinctions and clarification provided in the amended claim.

Therefore, since no teaching or suggestion of these elements is found in the Berger reference, and there exist no motivational basis for a combination with Berger, Applicant's Claim 1 cannot be considered obvious in view of that reference. Applicant respectfully requests that the rejection of Claim 1 and the claims that depend therefrom be withdrawn.

Claims 3-9. Dependent Claims 3-9 describe additional distinctions over the Berger reference that when considered on the whole of the invention provide a number of benefits. As these claims depend from independent Claim 1 which has been shown to be non-obvious in view of the Berger reference, these claims should be considered a fortiori allowable.

<u>Claims 32-39</u>. Dependent Claims 32-39 were added to the application to recite additional aspects of Claim 1, which has been shown to be non-obvious in view of the Berger reference. Therefore, these dependent claims should also be considered a fortiori allowable.

Therefore, independent Claim 1 teaches a number of aspects not found in the relied-upon Berger reference, and which would not be obvious in view of the Berger reference. Applicant respectfully requests that the rejection of independent Claim 1, and the claims which depend therefrom, be withdrawn.

# 4. Claims 40 and 41 are nonobvious.

Nor would the subject matter of new independent Claims 40 and 41 be obvious to a person having ordinary skill in the art in view of the cited references, either singly or

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in combination.

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Added Claims 40 and 41 are drawn to the same device as recited in Claim 1, specifically to "An apparatus for tracing electrical shorts in a wiring circuit under test". Therefore, the lack of support provided by the Berger reference is generally discussed for these claims as well.

Although independent Claims 40 and 41 are directed at the same invention as Claim 1, they are not written in the same means-plus-function form of Claim 1. Claim 40 is of similar scope to Claim 1. Claim 41 incorporates additional limits as already recited in claims which depend from Claim 1, wherein Claim 41 is narrower than Claim 1. There is nothing within these claims that would necessitate any additional searching by the Examiner.

It should be noted that these claims provide distinctions over the Berger reference as described within Claim 1 while extending the number of distinctions over that reference.

In particular the applicant has provided more detailed limitations of an embodiment from the Claim 1 recitation of the conditions under which the audible detection is generated as "a sudden change in circuit conductance <u>in relation to its</u> preceding value and not a fixed value of conductance".

Specifically, in Claim 40 the claim describes "a detector circuit configured for generating an output signal in response to detecting a change in the resistance of the wiring circuit by at least a predetermined amount at a sufficient rate of resistance change to trigger said detector circuit".

In Claim 41 a similar limitation is recited as "wherein the sudden change in voltage of the wiring circuit is sensed in response to a rise in voltage to exceed its former voltage by at least a predetermined amount at a sufficient rate of voltage increase to trigger said sensing circuit".

As described per Claim 1, there is no teaching of these aspects, and others, within the relied-upon references. Furthermore, Berger teaches away from

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annunciations based on detecting sudden changes. Wherein support would be similarly lacking for an obviousness rejection against independent Claims 40 and 41 as well.

The Berger reference does not suggest, teach or provide motivation for detecting only sudden short circuit changes to the circuit being traced and the annunciation thereof, and combining such a feature would cause the Berger device to generate false alarms.

Therefore, as there is no motivation for limiting Bergen detection to sudden changes and, further, since there is no suggestion or teaching which can be found in the references from which a person having ordinary skill in the art would find it obvious to modify these circuits accordingly to correspond to Applicant's claims, Claims 40 - 41 recite structure which is patentable over the cited references for purposes of 35 U.S.C. § 103.

# 5. Claim 2 is rejected under 35 U.S.C. § 103(a).

Claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Berger (U.S. Patent No. 3,991,413) in view of Talbot (U.S. Patent No. 5,144,225).

Claim 2. Dependent Claim 2 was rejected with a combination being made between the Ski lift cable checking system of Berger and the Electron beam probe device for integrated circuit testing of Talbot. First of all it should be readily apparent that these devices cannot be combined due to their disparate areas of art, objects and operating principles. There are numerous additional shortcomings of this combination.

In addition, as Claim 2 depends from independent Claim 1 whose nonobviousness has been discussed, Claim 2 should be considered a fortion allowable.

# 6. <u>Traversal of Rejection of Claim 1 Based on In re Donaldson.</u>

The Applicant respectfully traverses the grounds for rejection, and cites *In re Donaldson*, 16 F.3d 1189, 1193 (Fed. Cir. 1994)(en banc) as the basis for the traversal. Claim 1 is written in means plus function form pursuant to 35 U.S.C. §112, sixth

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paragraph, and therefore, must be interpreted during examination under In re-Donaldson.

In rejecting Claim 1, as well as the claims that depend therefrom, the Examiner made no specific fact findings as to the scope of equivalents for the means plus function elements in the claims. Instead, the Examiner appears to have followed the provisions of MPEP § 2183 ("Making a Prima Facie Case of Equivalence"), which states:

If the examiner finds that a prior art element performs the function specified in the claim, and is not excluded by any explicit definition provided in the specification for an equivalent, the examiner should infer from that finding that the prior art element is an equivalent, and should then conclude that the claimed limitation is anticipated by the prior art element. The burden then shifts to applicant to show that the element shown in the prior art is not an equivalent of the structure ... disclosed in the application. In re Mulder, 716 F.2d 1542, 219 U.S.P.Q. 189 (Fed. Cir. 1983). No further analysis of equivalents is required of the examiner until applicant disagrees with the examiner's conclusion, and provides reasons why the prior art element should not be considered an equivalent.

While the Examiner appears to have followed the provisions of MPEP §2183, such provisions are contrary to Federal Circuit law. The Federal Circuit has held that an examiner "construing means-plus-function language in a claim must look to the specification and Interpret that language in light of the corresponding structure ... described therein, and equivalents thereof," In re Donaldson, 16 F.3d 1189, 1193 (Fed. Cir. 1994)(en banc), and in so ruling expressly denied that "the PTO is exempt from this mandate." Id. The Federal Circuit added that it was specifically overruling any precedent that suggested or held to the contrary. Id. at 1193-94. In response to the PTO's argument that the court's ruling conflicted with the principle that a claim should

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be given its broadest reasonable interpretation during prosecution, the Federal Circuit held that the Donaldson decision was setting "a limit on how broadly the PTO may construe means-plus-function language under the rubric of 'reasonable interpretation.'"

Id. at 1194. In other words, an examiner's claim interpretation is not "reasonable" if it is not based on the specification's description of the implementation of the means element of the claim. The court then said, "Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such [means-plus-function] language when rendering a patentability determination." Id. at 1195.

Here, as in *Donaldson*, the Examiner is required by statute to look to the Applicant's specification and construe the "means" language as referring to corresponding means disclosed in the specification and equivalents thereof." See id. at 1195. However, the Examiner did not construe the means language of this claim, however. Nor did the Examiner find, on the basis of specific facts of record here, that the means disclosed in the Applicant's specification were equivalent to that of the cited references. Instead, as prescribed by MPEP §§ 2183-84, the Examiner simply presumed equivalence. The presumption methodology used here, which the MPEP prescribes, clearly conflicts with the requirements of the Federal Circuit's Donaldson decision. The approach taken by the Examiner in this case also conflicts with *In re Bond*, 931 F.2d 831 (Fed. Cir. 1990).

The very point of these cases is that, in this context, limitations from the specification control the interpretation of the claim. Under §112, paragraph 6, a means-plus-function element of a claim must be construed to mean that which is disclosed in the specification and its equivalents. In *Donaldson*, the Federal Circuit said that "our holding does not conflict with the general claim construction principle that limitations found only in the specification of a patent or patent application should not be imported or read into a claim." In other words, the court was saying that a §112, paragraph 6 "means" element does not need to be "imported or read into" a means-plus-function claim because the specification's limitations and their equivalents

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are already in the claim by virtue of §112, paragraph 6's command. Thus, the Federal Circuit said (16 F.3d at 1195): "What we are dealing with in this case is the construction of a limitation already in the claim in the form of a means-plus-function clause and a statutory mandate on how that clause must be construed."

Based on the foregoing, the Applicant respectfully submits that the rejection of Claim 1, as well as the claims that depend therefrom lacks proper foundation and that the rejection should be withdrawn. Those claims, each of which include means plus function limitations, should have been interpreted in view of the specification as required by *In re Donaldson*. If those claims had been so interpreted, they would have been allowable since the cited references do not, singly or in combination, teach, suggest or provide motivation or incentive for the subject matter recited in those claims.

### 7. Amendment of Claims 1 and 5-9.

<u>Claim 1</u>. Independent Claim 1 was amended to recite in the preamble "wiring" circuit under test. It should be appreciated that the term "circuit" within the application refers to wiring circuits. The field of the invention (paragraph [0005]) states "short tracing devices for wiring". There is no description within the Applicant's specification of testing integrated circuits, or other forms of circuit devices - only wiring circuits. These wiring circuits can be short circuits, or open circuit, or intermittent circuit, but these are all conditions of a wiring circuit. This amendment thus clarifies the use of the term circuit.

This can also be seen in the end portion of paragraph [0007]: "Shorts which arise in wiring for vehicles, trucks, trailers, tractor-trailer rigs and so forth often result from shorts between one or more wires and the frame of the vehicle, and is often difficult to trace. It should be appreciated, however, that a short with continuous conductance is much easier to diagnose than a short which appears only intermittently, because unless the circuit is in a shorted condition one cannot perform electrical tests to locate the short. Complicating the tracing process is the fact that the vehicle circuit being tested typically comprises a single wire that is usually contained somewhere

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within a somewhat stiff bundle of similar wires which is often protected by a sleeve or overwrap of some form."

The phrase "sufficiently continuous" was amended to "continuous" to reduce any possible ambiguity.

The phrase "said means for producing current configured for establishing an electrical connection to the wiring circuit anywhere along the length of the wiring circuit" was incorporated in Claim 1 to further clarify the term "tracing" as found in the preamble. This aspect is clearly described by the specification, including the end of paragraph [0008] "However, it is generally possible for the connection to be made anywhere along the length of the circuit, such as at the load or intermediary locations along the circuit."

Additionally this aspect is described in paragraph [0024] "Accordingly there is a need for a short circuit testing and isolation device that is particularly well-suited for troubleshooting electrical circuit wiring in a variety of vehicles and other systems employing similar current-carrying circuitry. The present invention satisfies those needs and others, and may be implemented at low cost."

The phrase "in relation to a preceding value of conductance and not a fixed value of conductance" was added to Claim 1 to clarify what is meant by "a sudden <u>change"</u>. Support for this is found in the original claims, FIG. 1B, and throughout the specification, including paragraph [0090]: "Whenever the voltage of the circuit under test rises to greater than its former voltage plus 0.6 volts, the voltage at the inverting input of op-amp IC3 exceeds that of the non-inverting input, resulting in its output grounding and pulling the voltage applied by resistor  $R_{14}$  to approximately zero volts. This does, of course, require that the rate of increase in circuit under test voltage exceed 1 volt per second (the charge rate of capacitor C<sub>8</sub>) plus 0.6 volts."

<u>Claim 5</u>. Dependent Claim 5 was amended to further clarify the detection of sudden change as recite in Claim 1. Specifically, the last phrase was changed to "in

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response to detecting a sufficient voltage change across said circuit under test <u>in a</u> sufficiently short period of time to trigger the detector". Support for this change is found within the specification, such as including paragraph [0098] "...any voltage increase of 0.7 volts arising within a short period of time triggers the annunciator...".

Claim 6. Dependent Claim 6 was amended. The wording of this claim was simplified by moving the word "voltage". The detector operation was clarified by reciting: "in response to conductance changes in said circuit under test which create a sufficient voltage change in the circuit under test veltage in a sufficiently short period of time to trigger the detector".

Claim 7-8. Dependent Claims 7-8 were amended to clarify phrasing relating the stated voltage ranges of the term "sufficient", specifically: "wherein said sufficient voltage change in the circuit under test voltage sufficient to trigger the detector is comprises a predetermined voltage change within the range [[of]] from approximately...™.

Claim 9. Dependent Claim 9 was amended to correct the antecedent basis for "sudden change" instead of "sudden rise" and to further distinguish an aspect of the sensing of sudden change according to a described embodiment.

The sudden change in further described in this instance as a sudden rise, specifically: "said sudden change which comprises a sudden voltage rise".

A claim element was added: "wherein the sudden change in voltage of the wiring circuit is sensed in response to a rise in voltage to exceed its former voltage by at least a predetermined amount at a sufficient rate of voltage increase to trigger the detection " which addresses the response to a rise in voltage. Support for this aspect is found throughout the specification, including paragraphs [0090], [0091], [0098], [0099], and so forth. This language was also included within newly added Claim 41.

#### 8. New Claims 32-41.

Claims 32-39. Dependent Claims 32-39 were added which depend from independent Claim 1.

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Claim 32. Dependent Claim 32 recites further details of the current selector recited in Claim 10 as was recited in the material of original Claim 18 and throughout the specification.

Claim 33. Dependent Claim 33 recites that the selection circuit of Claim 10 allows selecting one of multiple output currents as recited in the specification and in original Claim 19.

Claim 34. Dependent Claim 34 recites elements within the means for continuously monitoring the voltage and communicating sudden change to the means for audibly Indicating. The claim contains material from original Claim 20, as well reciting the capacitor as described throughout the specification, including paragraph [0085], and [0090]. The rise of voltage in these sections being an example of a first voltage change. The description of this circuitry provides even further clarification of one embodiment of detecting the "sudden changes" described in Claim 1.

Claim 35. Dependent Claim 35 recites additional aspects of the comparator circuit described in Claim 34, in which the capacitor is discharged in response to a second direction of voltage change in the wiring circuit. This aspect of the invention is described in the specification, including paragraph [0088]: "...the use of a forward biased diode in this position allows capacitor C8 to discharge back to the desired differential level whenever the conductance of the circuit under test increases, wherein its voltage drops." The descriptions of the comparator circuit refers to detection of a rise (first direction of voltage change), while the voltage drop in paragraph [0088] comprises a second direction of voltage change.

Claim 36-39. Dependent Claims 36-39 recites aspects of the means for audibly indicating which in one embodiment is configured to generate a fixed duration audio output, and in another embodiment which is generated by a buzzer device. The material for these claims is found throughout the specification and was also recited in original claim 43-44 and 46. Claim 38 also recites the repeatability aspect of the detection, as described in detail in the specification, including the last portion of

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paragraph [0100].

Claims 40 and 41. Independent Claims 40 and 41 have been added which are drawn to the same classification as the elected Species I, wherein the preamble recites "An apparatus for tracing electrical shorts in a circuit under test".

These claims are drawn to the same invention while describing the invention in a form other than the means-plus-function format of Claim 1. These added claims bring the number of independent claims in the Application back to three, as provided for by the payment of the original application fees.

Claim 40. Independent Claim 40 describes a similar level of detail as Claim 1, and includes the same clarifications added to Claim 1. Support for the material. elements of Claim 40 are found in original independent Claim 32 as well as throughout the specification of the invention.

Claim 41. Independent Claim 41 describes additional levels of detail beyond Claim 1, while being written in a non-means format. These additional limitations recite the elements of the invention according to an embodiment in greater detail than the other independent claims. This claim includes much of the language of amended claim 9 referring to detecting the "sudden change". Support for the material elements of Claim 41 are found in original independent Claim 24 as well as throughout the specification of the invention.

#### 9. Amendments Made Without Prejudice or Estoppel.

Notwithstanding the amendments made and accompanying traversing remarks provided above, Applicant has made these amendments in order to expedite allowance of the currently pending subject matter. However, Applicant does not acquiesce in the original ground for rejection with respect to the original form of these claims. These amendments have been made without any prejudice, waiver, or estoppel, and without forfeiture or dedication to the public, with respect to the original subject matter of the claims as originally filed or in their form immediately preceding these amendments. Applicants reserve the right to pursue the original scope of these claims in the future.

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such as through continuation practice for example.

### 10. No Additional Claim fees.

Original Claims 11-31, were canceled in response to the restriction requirement. Additional Claims 32-41 were added to the application. The original number of independent claims remains at three (3), while the total number of claims is now twenty (20), although a fee was included for thirty-one (31) total claims in the original application.

Consequently, no additional claim fees are required.

## 11. Conclusion.

Based on the foregoing, the Applicant respectfully requests that the various grounds for rejection in the Office Action be reconsidered and withdrawn with respect to the presently amended form of the claims, and that a Notice of Allowance be issued for the present application to pass to issuance.

In the event any further matters remain at issue with respect to the present application, the Applicant respectfully requests that the Examiner please contact the undersigned below at the telephone number indicated in order to discuss such matter prior to the next action on the merits of this application.

Date:

Respectfully submitted,

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